

## LITERATURE

### COMMENTS ON RECENT LITERATURE

*Clutch Size in Birds.* Great differences exist among the families of birds in the number of eggs laid per clutch. Since the populations of most species remain more or less constant, it is usually assumed that such variations in clutch size represent adjustments to different mortality rates. Yet it is difficult to understand how mortality factors affecting the whole life span of a bird can influence the number of eggs laid. In a recent important series of papers by David Lack on clutch size in birds and litter size in mammals, he points out that natural selection will favor those individuals producing the greatest number of offspring, regardless of potential dangers involved in overpopulation.

Natural selection, operating in the direct manner just suggested, presumably explains the egg laying feats of a codfish or a queen termite. Here physiological capacity (including seasonal cycles of the ovary) sets the only limit upon the number of eggs laid. The same may be true of most reptiles, but among birds it seems to hold only for the Megapodiidae and possibly for some parasitic species—in other words, for birds that do not incubate their eggs or care for their young.

Incubation imposes great restrictions upon clutch size. Sandpipers, for example, lay 4 large eggs; apparently this is the maximum number that can be covered by the parent. In some of the larger gulls a clutch of 3 is very constant and may also be as many as the bird can successfully incubate. These gulls have 3 distinct brood patches, 1 for each egg, suggesting that this clutch size is of long standing. Further evidence of this is the fact that sandpipers and gulls are “determinate” layers (Davis, 1942); if eggs are destroyed or removed during the laying period the birds will not lay additional ones in an “attempt” to complete the clutch as so many birds do.

Although clutch size in gulls, sandpipers, and probably a few other groups is apparently determined by the number of eggs the parent is capable of incubating, Lack believes this to be exceptional. Most species can incubate more eggs than they normally lay. Even the partridge, *Perdix perdix*, which lays as many as 15 eggs, can incubate 20 or more without decrease in hatchability (Lack, 1947). Lack believes that in such species—and this is his most important conclusion—clutch size is equivalent to the maximum number of young that can be reared by a given species at a particular season and locality.

In support of this plausible hypothesis Lack has assembled a certain amount of direct evidence. In the Starling, *Sturnus vulgaris*, banding records show that birds laying clutches of above average size actually leave fewer descendants than do those laying average clutches. Though some of the former group succeed in fledging unusually large broods, the young apparently leave the

nest in a weakened or retarded condition, since their mortality during the first few months thereafter is greater than among birds from broods of normal size (Lack, 1948b). In the Alpine Swift, *Apus melba*, analysis of banding records also suggests that normal clutch size represents the maximum number of young that can be reared (Lack and Arn, 1947). This paper has been criticized at some length by Bender (1948), who emphasizes some of the difficulties involved in such studies, and suggests a number of additional factors which may influence clutch size.

Lack has assembled circumstantial evidence in favor of his hypothesis that is impressive because of its very quantity. Latitudinal increases in clutch size he attributes to the longer days of the northern summer, permitting birds to care for larger broods. In the night feeding goatsuckers this trend is absent. Differences in the number of eggs in first and second broods also seem to agree well with seasonal variations in the quantity of food available. The larger broods usual in cavity nesting birds he considers a result of lessened predation. This permits, without excessive mortality, a longer nestling period than is possible in many species that build open, exposed nests.

If natural selection produces a normal clutch size corresponding to the maximum number of young a pair of birds of a particular species can rear, rapid increases in population might be expected. Such increases are potentially possible but as the numbers of a species mount, its mortality factors operate more stringently and eventually equal the rate of reproduction (Nicholson, 1933). Predation, to mention one population control, increases greatly, as Errington has shown, when a species becomes so numerous as to overcrowd its normal habitats. In the Gray Heron, *Ardea cinerea*, a severe winter sometimes decimates the British population. Recovery is then very rapid, but as competition for food or other essentials becomes sharper, the population again becomes stabilized (Lack, 1946). Clutch size usually remains the same throughout such fluctuations, though in a few raptors it responds to variations in food supply.

This review barely suggests the great amount of data on clutch size and related subjects that Lack has assembled and tabulated. His analysis leads to important conclusions but at the same time reveals the need for much additional investigation. Many of the problems remaining unanswered can be studied to advantage by anyone able to spend some time in the field during the nesting season.

#### REFERENCES

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— AND HANS ARN

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DEAN AMADON

BOOK REVIEWS

*Birds of Cincinnati and Southwestern Ohio*. By EMERSON KEMSIES. Ohio Audubon Society, Cincinnati, Ohio, 1948: 8¼ x 11 in., mimeographed, pp. ii + 60.

The region covered by this bulletin includes Hamilton, Clermont, and Butler counties in Ohio. Within the area are Ohio River bottomlands and upland pastures. The author properly calls attention to an interesting local transition between northern and southern birds. Data are given on 292 species and races, most of them represented by specimens, but a few of questionable status. There are brief notes on the ecology of some species.

The American Woodcock is interestingly considered "a regular and frequent summer resident throughout the area". Red-shouldered Hawks are listed as "fairly common summer residents", while Red-tailed Hawks are not recorded as breeding, and are "seen much less frequently than the following species" (i.e., Red-shouldered Hawk). In the nearby Appalachian region, with which this reviewer is much more familiar, the Red-tailed Hawk is generally a breeding species of the broad river valleys, while the Red-shouldered Hawk is much more common in the mountains.

Accidental confusion between the ranges of the Trumpeter Swan and the Whooping Crane seems apparent. On page 15 the Whooping Crane is described as "...now almost extinct except for a few pairs in Yellowstone and British Columbia. . .".

Bird students in the Cincinnati region will find Mr. Kemsies' bulletin a very useful publication. Other observers in the Ohio Valley will be interested in comparing local conditions in southwestern Ohio with those prevailing in their own regions.

MAURICE BROOKS

*How to Know the Birds: A Simple Aid to Bird Recognition*. By ROGER TORY PETERSON. A Mentor Book, Published by the New American Library of World Literature, Inc., New York, N. Y. Pp. 144, profuse illus. in black and white. Paper covers. Index. 1949. Price 35¢. Also published by Houghton Mifflin Co., Boston with cloth covers and 5 colored plates. Price \$2.00.

The ornithologist has had access to expensive reference books that told him the lengths of bills, tarsi, and folded wings in millimeters, numbers of eggs per clutch, egg measurements, etc. But this inexpensive book tells how to identify birds through perception of their silhouettes, markings, actions, or habitats.

The Peterson Field Guides, superseding all former such publications in their design, may still exclude a number of impecunious bird lovers from owning them, but there is now no excuse for the veriest beggar not to argue with his companion in poverty as to whether that lately-seen bird was a Chipping or a Field Sparrow.

Cheap literature, in the reviewer's opinion, is a blight on the reading public, but in this instance all he can find breath to say is, "Bravo!" We would have a better land and culture